

## **10.0 INCIDENTAL TAKE STATEMENT**

### **10.1 INTRODUCTION**

Section 9 of the ESA and Federal regulations pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct.” Incidental take is defined as “take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.” Under the terms of Section 7(b)(4) and Section 7(a)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the ESA, provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described in this section are nondiscretionary and must be undertaken by the Corps, BPA, and BOR. The Action Agencies have a continuing duty to regulate the activities covered by this incidental take statement. If the Action Agencies fail to assume and implement the terms and conditions of this incidental take statement, the protective coverage of Section 7(a)(2) may lapse. To monitor the effect of incidental take, the Action Agencies must report the progress of the action and its effect on each listed species to NMFS, as specified in this incidental take statement [50 CFR Section 402.14(i)(3)].

NMFS has developed the following incidental take statement based on the premise that the RPA described in Section 9 of the biological opinion will be implemented.

## **10.2 AMOUNT OR EXTENT OF ANTICIPATED TAKE**

### **10.2.1 Incidental Take Associated with Operation of FCRPS**

The level of incidental take expected to occur as a result of the RPA will vary annually as the RPA measures are implemented. Initially, the expected take will be approximately equal to the juvenile and adult mortality rates associated with the proposed action, as estimated in Sections 6.2 and 6.3. Once the RPA measures are completely implemented, no later than 2010, the expected take will be reduced to a level that is approximately equal to the juvenile and adult mortality rates associated with the RPA, as estimated in Section 9.7. During the intervening period, the incidental take is expected to decrease on a schedule that cannot be precisely determined at this time. The estimate of incidental take will, therefore, be updated before March 1 of each year. This update will be based on the preceding year's annual report, which will describe those elements of the RPA that were completed in the preceding year, those anticipated to be implemented during the upcoming year, and research to further characterize the effects of implementing those elements on survival of listed ESUs.

Tables 10.1-1 and 10.1-2 identify the expected incidental take resulting from the RPA during 2001 and 2010 for juvenile and adult salmonids, respectively. The take estimates include mortality expected to occur as a result of passage through the mainstem FCRPS projects only. The juvenile take represents means of a range of annual estimates and, for some ESUs, a range of differential delayed mortality estimates. Averages included 1994 through 1999 for spring chinook and steelhead and 1995 through 1999 for SR fall chinook. The SR spring/summer chinook D (delayed mortality) estimate ranged from 0.63 to 0.73, the SR fall chinook D estimate was 0.24, and the SR steelhead D estimate ranged from 0.52 to 0.56.

Quantitative estimates of take are not possible for the spawning and incubation stages of SR fall chinook, LCR chinook salmon, and CR chum salmon. The incidental take of these species during the spawning and incubation life stages will be considered authorized if flow operations are implemented as described in Section 9.6.1.2. Take of juvenile sockeye salmon will be considered authorized as long as the allowable take of juvenile SR spring/summer chinook and SR steelhead is not exceeded, due to the similarity in timing and similar size of each ESU.

### **10.2.2 Incidental Take Associated with Offsite Mitigation**

This biological opinion does not authorize incidental take associated with any projects related to offsite mitigation. It is anticipated that the Action Agencies will seek authorization for any take associated with offsite mitigation projects through separate consultations with NMFS, once details of the proposed actions are determined.

**Table 10.1-1** Estimates of incidental take of juvenile salmonids resulting from the RPA during 2001 and 2010.

ESU	Estimated Total System Juvenile Mortality (%)	
	2001	2010
<i>Chinook</i>		
SR spring/summer <sup>1</sup>	43	42
SR fall <sup>2</sup>	88	87
UCR spring <sup>3</sup>	43	34
LCR spring <sup>4</sup>	13	9
LCR fall <sup>4</sup>	28	22
UWR	N/A	N/A
<i>Steelhead</i>		
SR <sup>5</sup>	52	49
UCR <sup>6</sup>	41	32
MCR <sup>7</sup>	41	32
LCR <sup>8</sup>	13	9
UWR	N/A	N/A
<i>Sockeye</i>		
SR <sup>9</sup>	N/A	N/A
<i>Chum</i>		
CR <sup>10</sup>	28	22

Note: Estimates of mean incidental take resulting from RPA in 2001 and 2010. Estimates of take during intervening years will be updated annually. N/A = not applicable (for ESUs that do not pass through the hydrosystem). Estimates for ESUs with populations that pass variable numbers of dams are for maximum number of dams passed.

<sup>1</sup> Represents survival of transported and nontransported smolts, including NMFS' (2000e) estimate of differential delayed mortality. Take of inriver migrants is estimated as 59% in 2001 and 50% in 2010. For comparison, estimate of natural mortality is 15% (Appendix A).

<sup>2</sup> Represents survival of transported and non-transported smolts, including PATH 24% estimated of differential delayed mortality. Take of inriver migrants is estimated as 90% in 2001 and 86% in 2010. For comparison, estimate of natural mortality is 32% to 77% (Appendix A).

<sup>3</sup> For comparison, estimate of natural mortality is 9% (Appendix A).

<sup>4</sup> For comparison, estimate of natural mortality is 2% (Appendix A).

<sup>5</sup> Represents survival of transported and nontransported smolts including NMFS' (2000e) estimates of differential delayed mortality. Take of inriver migrants is estimated as 59% in 2001 and 49% in 2010. For comparison, estimate of natural mortality is 16% (Appendix A).

<sup>6</sup> For comparison, estimate of natural mortality is 9% (Appendix A).

<sup>7</sup> For comparison, estimate of natural mortality is 9% (Appendix A).

<sup>8</sup> For comparison, estimate of natural mortality is 1% (Appendix A).

<sup>9</sup> A quantitative estimate is not available for this ESU. SR sockeye take is authorized as long as allowable take of SR spring/summer chinook and SR steelhead is not exceeded.

<sup>10</sup> Based on LCR fall chinook survival estimates. No estimate of natural survival rate is available for comparison.

**Table 10.1-2.** Estimates of incidental take of adult salmonids expected to result from RPA during 2001 and 2010. Estimates of adult take will be updated annually during the intervening years. N/A = not applicable (i.e., for ESUs that do not pass FCRPS projects). Estimates for ESUs with subbasin populations that pass different numbers of dams are for the maximum number of dams passed.

ESU	Estimated Adult Mortality (%)	
	2001	2010
<i>Chinook</i>		
SR spring/ summer	18	15
SR fall	29	26
UCR spring	9	8
LCR spring	3	2
LCR fall	4	4
UWR	N/A	N/A
<i>Steelhead</i>		
SR	23	20
UCR	12	11
MCR	12	11
LCR	3	3
UWR	N/A	N/A
<i>Sockeye</i>		
SR	14	11
<i>Chum</i>		
CR	4	4

### **10.3 EFFECT OF THE TAKE**

In the biological opinion, NMFS determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

The overall incidental take of ESA-listed juvenile and adult anadromous fish species under the proposed action is described in Tables 9.7.1 and 9.7.2, respectively. The take of listed species resulting from the research and monitoring activities described in Tables 9.7.1.1 and 9.7.1.2 is incorporated into the earlier tables and is not in addition to those estimates. A proportion of the overall authorized take is partitioned among the specifically numbered research projects described in Section 9.6.5.5.

### **10.4 REASONABLE AND PRUDENT MEASURES**

#### **10.4.1 Monitor Incidental Take**

The Action Agencies will monitor the level of incidental take associated with the RPA and report the results to NMFS in a timely manner.

#### **10.4.2 Reduce Incidental Take by Improving Juvenile and Adult Passage Survival**

The Action Agencies will reduce the level of incidental take by implementing measures to further improve survival of juveniles and adults, in addition to measures required by the RPA. NMFS has determined that the additional measures specified in Section 10.5 constitute only minor changes to the RPA.

## **10.5 TERMS AND CONDITIONS**

### **10.5.1 Terms and Conditions Related to Monitoring Take**

#### **10.5.1.1 Evaluate Reach Survivals**

The Action Agencies will estimate dam passage and inriver survival of both juvenile and adult migrating salmonids. Using PIT-tags, radio tags, sonic tags, or other developing technology, the Action Agencies will measure the survival of juvenile fish migrating through the FCRPS. Using radio and PIT tags and additional techniques, they will also measure the survival and reproductive success (arrival on the spawning grounds, successful spawning behavior, and successful gamete production) of adult salmonids migrating through the FCRPS. The primary focus of the current PIT-tag monitoring program is on juvenile inriver survival and return rates. However, as adult PIT-tag detection facilities are developed and installed, they will be used to measure adult passage survival on a per-project basis for fish with known origins and passage histories. Until then, a portion of the adult salmonid population will be radio-tagged, and their migration behavior and survival will be monitored as they migrate upstream through the FCRPS.

The Action Agencies, in coordination with NMFS through the annual planning process, will continue to provide funding for monitoring wild juvenile fall chinook survival, growth, and other early life attributes. Knowledge of wild fish early life attributes is critical as a baseline comparison for studies involving juvenile hatchery fall chinook used as surrogates for wild fish. Also, supplementation of juvenile fall chinook above Lower Granite Dam is resulting in increased parr densities. At some point, decreased growth may occur, affecting the survival of wild fish.

The Action Agencies will continue to provide funding for required monitoring of juvenile fish passage at all dams with bypass systems. Facilities with PIT-tag detection capability at selected FCRPS projects will be provided for this purpose. In addition, BPA is responsible for funding the smolt monitoring program coordinated and implemented by the Fish Passage Center, and the Corps is responsible for funding sampling relative to the juvenile fish transportation program and facility operations. To reduce juvenile fish handling and staffing requirements, multiple data sets are collected from sampled fish by onsite fishery agency personnel. For example, the Corps requires collection of fish condition information (injury, descaling, length, weight, etc.) to detect juvenile fish passage facility problems that can descale, injure, or kill fish. The Corps also needs information regarding the numbers and weights of fish collected and the species composition for holding and loading purposes at the collector dams. This sampling effort also meets the requirements of approved monitoring programs (smolt monitoring, GBT sampling) and research (AFEP, NWPPC's Fish and Wildlife Program), as well as new research required by this biological opinion). Given the multiple tasks accomplished under the program, the Action Agencies involved should share the cost of the program. Sampled juvenile fish handling at the projects should remain the responsibility of fishery agency personnel.

**10.5.1.2 Monitor Smolt-to-Adult Returns**

The Corps and BPA, in coordination with NMFS through the annual planning process, will evaluate transport-to-inriver return ratios for wild SR yearling chinook salmon and steelhead. In addition, the Corps and BPA will also evaluate effects of transportation of summer-migrating, subyearling SR chinook salmon.

Currently, the only way to conduct this research on spring-migrating fish is to mark and release wild fish at Lower Granite Dam, collect some for transport at Little Goose Dam, and allow others to continue their migration inriver. This design should continue until wild SR anadromous salmonids are abundant enough to conduct studies by PIT-tagging wild fish in natal areas above the lower Snake River dams. If the decision for the long-term operation of FCRPS projects on the lower Snake River includes continued reliance on transportation, the Corps and BPA will continue transport survival studies for spring and summer migrants passing Lower Granite Dam in future years.

Future research to evaluate the smolt-to-adult survival of subyearling fall chinook transported from Lower Granite versus the survival of marked study fish left to migrate in river will require adequate numbers of representative test fish (e.g., Lyons Ferry hatchery stock) and also may require special spill operations at one or more of the four collector dams.

**10.5.1.3 Monitor Post-transport and Post-bypass Delayed Mortality**

The Corps and BPA, in coordination with NMFS through the annual planning process, will include an evaluation of D of transported fish relative to inriver migrating juvenile anadromous salmonids during all transport evaluations.

Considerable uncertainty exists concerning the levels of differential post-Bonneville Dam mortality of transported and nontransported fish. Evaluations of post-transport and post-bypass delayed mortality should receive high priority. Determining how much transportation mitigates for the loss of juvenile anadromous salmonids during passage through the hydrosystem will be given the highest priority.

**10.5.1.4 Monitor Juvenile Fish Passage at Dams**

The Action Agencies will continue to provide funding for required monitoring of juvenile fish passage at all dams with bypass systems. Facilities with PIT-tag detection capability at selected FCRPS projects will be provided for this purpose. In addition, BPA is responsible for funding the smolt monitoring program coordinated and implemented by the Fish Passage Center, and the Corps is responsible for funding sampling relative to the juvenile fish transportation program and facility operations. To reduce juvenile fish handling and staffing requirements, multiple data sets are collected from sampled fish by onsite fishery agency personnel. For example, the Corps requires collection of fish condition information (i.e., injury, descaling, length, weight, etc.) to

detect juvenile fish passage facility problems that can descale, injure, or kill fish. The Corps also needs information regarding the numbers and weights of fish collected and the species composition for holding and loading purposes at the collector dams. This sampling effort also meets the requirements of approved monitoring programs (i.e., smolt monitoring, GBT sampling) and research (AFEP, the NWPPC's Fish and Wildlife Program), as well as new research required by this biological opinion. Given the multiple tasks accomplished under the program, the Action Agencies involved should implement cost sharing of the program. Sampled juvenile fish handling at the projects should remain the responsibility of fishery agency personnel.

#### **10.5.1.5 Monitor Effects of Dissolved Gas Supersaturation**

The Action Agencies will monitor the effects of TDG. This annual program will include physical and biological monitoring and will be developed and implemented in consultation with the Water Quality Team and the Mid-Columbia PUDs' monitoring programs.

At a minimum, the physical monitoring components of this plan will include placement of physical TDG monitors in the tailraces and forebays of all lower Snake and lower Columbia river dams and daily recording of TDG data in the Columbia River Operational Hydromet Management System (CROHMS) database. This program will also include a QA/QC component, with redundant and backup monitors at as many locations as determined necessary by the Water Quality Team; calibration of monitoring equipment at least every 2 weeks; enough funding for spot-checking monitoring equipment during the fish passage season (with the number determined in the preseason by the Water Quality Team); an error-checking, correcting, and recording function for CROHMS data; and daily data reporting. The QA/QC components will be reviewed annually and modified as improved information and techniques become available. The Action Agencies will conduct the annual review in coordination with the Water Quality Team. At a minimum, the biological monitoring components will include smolt monitoring at selected smolt monitoring locations, adult monitoring at Bonneville and Lower Granite dams, and daily data collection and reporting.

#### **10.5.1.6 Install Adult PIT-tag Detectors to Facilitate Monitoring**

BPA and the Corps will install adult PIT-tag detectors at appropriate FCRPS projects before the expected return of any adult salmon from the 2002 juvenile outmigration. If technical problems preclude installation of these detectors in this time frame, the evaluation of spring migrant transportation from McNary should be delayed until the systems are installed.

#### **10.5.1.7 Monitor Adult Survival**

The Action Agencies will conduct a comprehensive evaluation to assess survival of adult salmonids migrating upstream and factors contributing to unaccounted losses. Broad objectives for such studies may include the following:



- Evaluate survival rates between dams and through the system.
- Partition interdam losses by factor.
- Assess causal mechanisms associated with losses.
- Assess reproductive success, including causal mechanisms associated with reduced reproductive success, if any.
- Identify measures, as appropriate, to address factors affecting passage, survival, and reproductive success.

More specific investigations may include the following:

- Fallback (operational-related versus other factors)
- Passage delay (in relation to project and reservoir operations, including turbines, spill, and peaking)
- Injury (resulting from passage, marine mammals)
- Headburns
- Homing/straying
- Mainstem spawning
- Tributary turnoff and spawning
- Effect of TDG
- Effect of temperature (including use of cool water microhabitat)
- Energy expenditure
- Susceptibility to disease
- Unaccounted incidental mortality associated with harvest
- Cumulative effects (synergism)

**10.5.1.8 Monitor Turbine Efficiency**

BPA and the Corps will prepare an annual summary report detailing compliance with the 1% peak efficiency turbine operation guidelines for the FCRPS projects. The report should be provided to the Fish Facility Operation and Maintenance Coordination Team and NMFS by February 1 of each year.

A summary report will allow review of seasonal operation of turbine units which may reveal methods to improve operations for safe fish passage.

**10.5.1.9 Report Project Operations in Timely Manner**

The Corps will work through the FPOM to make hourly individual turbine unit and spill bay operation data available on its website, real time, during the juvenile migration season. These data are necessary to monitor compliance with operating criteria in the annual Fish Passage Plan (e.g., unit operating priorities and spill patterns), as well as agreed-on special project operations for research or maintenance. These data were available for some projects while information was collected for the gas-abatement program, but they have since been discontinued.

**10.5.1.10 Report Progress in Implementing Fish Passage Plan in Timely Manner**

The Action Agencies, in coordination with the annual planning process, will continue to provide weekly and annual reports regarding implementation of the fish passage plan to FPOM.

The current practice of providing 7-day Corps project adult/juvenile facility reports and 7-day fish transportation summaries to NMFS via electronic mail once a week has worked well and should continue. Additionally, hard copies of these reports have been formally submitted monthly. Since NMFS staff already have the desired information up to several weeks earlier, it is no longer necessary to provide formal hard copies monthly. Rather, the Corps should provide these reports to NMFS once a year (at the February FPOM meeting) in electronic format on a compact disk for archiving. Specific details should be developed in coordination with FPOM.

**10.5.2 Terms and Conditions Related to Improving Juvenile and Adult Passage Survival****10.5.2.1 Develop a TDG Model to Inform Spill and TDG Management Decisions**

The Action Agencies will complete development of, and continue to refine, a TDG model to be used as a river operations management tool. Once the model is developed, applications and results will be coordinated through the Water Quality Team. The Action Agencies will coordinate the systemwide management applications of gas abatement model studies with the annual planning process, the Transboundary Gas Group, the Mid-Columbia PUDs, and other interested parties.

TDG supersaturation, caused by water spilling over dams, can result in the injury or mortality of juvenile salmonids. Since the 1960s, increased hydraulic capacity at powerhouses of mainstem projects, increased water storage, and structural modification to spillways have substantially reduced this problem. High levels of TDG have, however, been measured under some river conditions even in recent years, e.g., during periods of involuntary spill.

#### **10.5.2.2 Model Water Temperature to Inform Operational Decisions**

By June 30, 2001, the Action Agencies will develop and submit for NMFS' and EPA's approval a plan to model the water temperature effects of alternative Snake River operations.

The modeling plan should focus on water temperatures in the Snake River from Hells Canyon Dam on the Snake River and from Dworshak Dam on the Clearwater River to Bonneville Dam on the Columbia River, with predictive nodes located at the near-dam forebays and tailraces of each project. Both one-dimensional and multidimensional models (due to reservoir stratification) may be needed to fully define expected temperature conditions within the reach. The models should be developed to function both as a preseason planning tool and to provide predicted outcomes of immediate operations in real time.

#### **10.5.2.3 Develop Temperature Data Collection System to Inform Operational Decisions**

The Action Agencies will develop, in consultation with EPA, NMFS, and state and Tribal water quality agencies, a temperature data collection strategy. Such a strategy is necessary for developing and operating the models and documenting the effects of project operation.

Existing water temperature and meteorological data are inadequate for this purpose. Existing data and statistical tools will be used to identify locations where additional or improved data collection, in terms of precision, accuracy, and frequency, would be most beneficial.

#### **10.5.2.4 Assess Use of Safer PIT-tag Detection Methods**

The Corps and BPA will assess less-intrusive, PIT-tag interrogation methods at FCRPS juvenile bypass systems with interrogation sites, including McNary, John Day, and Bonneville dams. The Corps and BPA shall also assess providing similar detection capability for the Ice Harbor juvenile bypass system.

The Corps and BPA should assess the use of full bypass flow PIT-tag detection, without the need to dewater and route fish through separators and sample flumes, with the possible benefit of reducing adverse survival effects of passage through multiple bypasses.

**10.5.2.5 Improve Panel Design of Extended Submerged Intake Screens**

The Corps will complete the extended submerged intake screen systemwide letter report and implement recommended improvements.

The Corps will complete investigation of fish performance and engineering issues pertaining to the need for improved porosity-control panel and panel connection design and install improved panels in all extended, submerged-intake screens. In particular, the Corps will develop improved vertical barrier screen (VBS) gateway cleaning and inspection measures for McNary and John Day dams and implement them, as warranted. The Corps will also develop improved debris handling measures in the forebays and screen/bypass systems to limit juvenile injury and mortality.

**10.5.2.6 Implement Studies to Reduce Bird Predation at FCRPS Projects**

The Action Agencies will recover PIT-tag information from predacious bird colonies and evaluate trends, including hatchery-to-hatchery and hatchery-to-wild depredation ratios.

Evaluation of this information, when combined with bird and fish behavioral information, will help managers develop a better understanding of issues such as prey selection, stock-specific vulnerability, and potential long-term predation effects on specific listed stocks, including the effectiveness of management actions to reduce predation by birds.

**10.5.2.7 Reduce Incidental Take Associated with Annual Fish Passage Plans**

The Action Agencies, in coordination with the FPOM, will implement or reconcile, in writing, comments received from NMFS regarding ways of reducing incidental take in the current and future Corps' Fish Passage Plans before release of the plan each year.

Review of the final 2000 plan indicated that only about 40% of NMFS' comments (NMFS letter to William Branch, dated January 21, 2000) on the Portland District projects were addressed by the text in the plan. The Corps has to incorporate NMFS' recommendations for reducing delayed mortality or explain in writing why the recommendations were not implemented.

**10.5.2.8 Reduce Mortality Associated with Special Facility Operations**

All planned special facility operation activities that cause any facility to be out of compliance with the operations and criteria in the main text of the Fish Passage Plan (and expected to result in the take of listed salmon stocks) must be coordinated with NMFS through the Regional Forum process at least 1 month before the anticipated action date.

Identifying special project operations in the Fish Passage Plan does not necessarily mean that the action has undergone the requirements of ESA Section 7 consultation. Generally, this section of

the plan is not ready for review with the rest of the draft plan, and insufficient consultation occurs before release of the plan. Essential information to be provided includes a brief summary of the action, location, anticipated date and time, analysis of potential impact to listed salmon stocks, and potential alternative actions.

#### **10.5.2.9 Develop Action Plan for Reducing Steelhead Holding in John Day Fish Ladders**

The Corps will use information from previous and ongoing investigations regarding the problem of adult steelhead holding and jumping in the fish ladders at John Day Dam, develop a proposed course of action, and implement as warranted.

This problem has been investigated in a fragmented manner for years. A more detailed collation of cumulative work to date is required, combined with an assessment of alternatives.

#### **10.5.2.10 Evaluate Kelt Passage and Potential Improvements**

The Corps will initiate an adult steelhead downstream migrant (kelt) assessment program to determine the magnitude of passage, their contribution to population diversity and growth, and potential actions to provide safe passage.

Evaluations should be conducted to review available literature and develop pilot testing regarding reconditioning of kelts. The Corps will assess and conduct a short-term holding evaluation at a project site where kelt are more abundant and initiate a kelt transportation pilot study as a possible means of reducing dam passage mortality. The Corps will evaluate kelt passage associated with the RSW at Lower Granite (described in Section 9.2.2.4), which will be prototype-tested in 2001 in the context of juvenile fish passage. The Corps will synthesize these work elements and report the magnitude of kelt passage to the NMFS Regional Forum, the effects of passage on their survival, and potential actions to improve their survival, if deemed appropriate, by 2003.

#### **10.5.3 Terms and Conditions Related to FCRPS Research Projects Described in Section 9.6.5.3**

The specific terms described below are addressed to “the researcher” because NMFS expects that the Action Agencies will conduct the research or contract it with other entities. These terms and conditions apply to the Action Agencies or their contractors who will conduct the research. The terms and conditions also refer to the researcher’s designated take authorization in this incidental take statement, i.e., take associated with each numbered research activity, not to an unidentified researcher. The specific terms and conditions are described below:

**10.5.3.1 Special Conditions**

- ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during sampling and processing. Adequate circulation and replenishment of water in holding units is required. When using gear that captures a mix of species, ESA-listed fish must be processed first to minimize the duration of handling stress. ESA-listed fish must be transferred using a sanctuary net (which holds water during transfer) whenever necessary to prevent the added stress of being out of water. Should NMFS determine that a researcher's procedure is no longer acceptable, the researcher must immediately cease such activity until NMFS determines an acceptable substitute procedure.
- Each ESA-listed fish handled out of water must be anesthetized when necessary to prevent injury or mortality. Anesthetized fish must be allowed to recover (e.g., in a recovery tank) before being released. Fish that are simply counted must remain in water, but they do not have to be anesthetized.
- To minimize the lateral transfer of pathogens, a sterilized needle must be used for each individual injection when PIT-tagging ESA-listed fish. Sterilization methods are required for the application of surgically implanted radio transmitters.
- Whenever possible, unintentional or indirect mortalities of ESA-listed juvenile fish that occur during scientific research and monitoring activities shall be used in place of intentional lethal take, if applicable.
- Each researcher must ensure that the ESA-listed species are taken only by the means, in the areas, and for the purposes set forth in the research proposal, as limited by the terms and conditions in this incidental take statement.
- Each researcher, in effecting the take authorized by this incidental take statement, is considered to have accepted the terms and conditions of this incidental take statement and must be prepared to comply with the provisions of this incidental take statement, the applicable NMFS regulations, and the ESA.
- Each researcher is responsible for the actions of any individual operating under the authority of the researcher's designated take authorization within this incidental take statement. Such actions include capturing, handling, releasing, transporting, maintaining, and caring for any ESA-listed species authorized to be taken by this incidental take statement.
- Each researcher, staff member, or designated agent acting on the researcher's behalf must possess a copy of this incidental take statement when conducting the activities

for which a take of ESA-listed species or other exception to ESA prohibitions is authorized herein.

- Researchers may not transfer or assign a take authorization included within this incidental take statement to any other person(s), as person is defined in Section 3(12) of the ESA. The take authorization ceases to be in force or effective if transferred or assigned to any other person without prior authorization from NMFS.
- Each researcher must obtain any other Federal, state, and local permits/authorizations necessary to conduct the activities provided for in this incidental take statement.
- Each researcher must coordinate with other applicable comanagers and/or researchers to ensure that no unnecessary duplication and/or adverse cumulative effects occur as a result of the researcher's activities.
- Each researcher must allow any NMFS employee(s), or any other person(s) designated by NMFS, to accompany field personnel during the activities provided for within this incidental take statement. Each researcher must allow such person(s) to inspect the researcher's records and facilities if such records and facilities pertain to ESA-listed species covered by this incidental take statement or NMFS' responsibilities under the ESA.
- Under the terms of NMFS' regulations, a violation of any of the terms and conditions of this incidental take statement will subject the offending researcher, and/or any individual who is operating under the authority of this incidental take statement, to penalties as provided for in the ESA.
- Each researcher is responsible for biological samples collected from ESA-listed species as long as they are useful for research purposes. The terms and conditions concerning any samples collected remain in effect as long as the researcher maintains authority over and responsibility for the material taken. A researcher may not transfer biological samples to anyone not listed in the research proposal without obtaining prior written approval from NMFS. Any such transfer will be subject to such conditions as NMFS deems appropriate.
- NMFS may amend a take authorization identified in this incidental take statement or adjust specific take levels after reasonable notice to the applicable researcher.
- NMFS may revoke a take authorization identified in this incidental take statement if the activities it provides for are not carried out, if the activities are not carried out in accordance with the conditions of this incidental take statement and the purposes and requirements of the ESA, or if NMFS otherwise determines that the continuation of activities would operate to the disadvantage of ESA-listed species.

**10.5.3.2 Annual Reporting and Authorization Requirements**

The conduct of scientific research/monitoring activities each year is contingent on submission and approval of a report on each preceding year's research and monitoring activities. Annual reports are due by January 31 of each year. The report must include the following:

- A detailed description of scientific research and monitoring activities, including the total number of fish taken at each location, an estimate of the number of ESA-listed fish taken at each location, the manner of take, and the dates and locations of the take
- Measures taken to minimize disturbances to ESA-listed fish and the effectiveness of these measures, the condition of ESA-listed fish taken and used for research and monitoring, a description of the effects of research and monitoring activities on the subject species, the disposition of ESA-listed fish in the event of mortality, and a brief narrative of the circumstances surrounding fish injuries or mortalities to ESA-listed fish
- Any problems that may arise during research and monitoring activities, and a statement as to whether the activities had any unforeseen effects
- A description of how all take estimates were derived
- Any preliminary analyses of the data
- Steps that have been and will be taken to coordinate research and monitoring activities with those of other researchers

**10.5.3.3 Operational Reporting and Notification Requirements**

- Researchers must provide plans for future undefined projects and/or changes in sampling locations or research/monitoring protocols and obtain NMFS' approval before implementation.
- Each researcher must alert NMFS whenever the authorized level of take is exceeded, or if circumstances indicate that such an event is imminent. Notification should be made as soon as possible, but no later than 2 days after the authorized level of take is exceeded. The researcher must then submit a detailed written report to NMFS. Pending a review of the circumstances, NMFS may suspend the research and monitoring activities or implement reasonable measures and/or alternatives to allow research and monitoring activities to continue.



- Each researcher must alert NMFS when a take of any ESA-listed species not included in the research proposal is killed, injured, or collected during the course of research and monitoring activities. Notification should be made as soon as possible, but no later than 2 days after the unauthorized take. The researcher must then submit a detailed written report to NMFS. Pending a review of the circumstances, NMFS may suspend research and monitoring activities or implement reasonable measures and/or alternatives to allow research and monitoring activities to continue.

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